Flows in the Czech Labor Market and Foreign Workers[1]

Vít POŠTA – Libuše MACÁKOVÁ*

Abstract

In the paper we analyse the flows in and out of the unemployed together with the flows of the foreign workers into the Czech labour market. Using the statistical data we provide comparison of the number of foreign workers and the unemployment rate in the Czech Republic and analyze the skill levels of jobs that the foreigners occupy.To test the possible effects of the presence of the foreign workers we use the theory of the search models and regression analysis and check for possible effects of foreign workers on the dynamics of wages and unemployment rate. We show that there no significant effects of foreign workers and that the search model gives rather satisfactory results with respect to the other determinants of wage growth and unemployment rate.

Keywords: *foreign workers, regression, search model, unemployment rate, wages*

JEL Classification: E24, J61, J64

1. Introduction

Advanced economies greatly depend on the flexibility of the domestic labor market, the ability to attract workers from abroad in the case of a shortage of domestic labor, but also on the ability to reduce the number of foreign workers in the event of their excessive amount, i.e. during the times of rising unemployment rate. This aspect of the Czech labor market is the subject of the following text in terms of the assessment of the factors behind the dynamics of wages and unemployment rate. The starting point of the analysis will be a review of quantitative facts with respect to the participation of the foreign workers in the Czech Republic.

* Vít POŠTA – Libuše MACÁKOVÁ, University of Economics in Prague, Faculty of Business Administration, Department of Microeconomics, Nám. W. Churchilla 4, 13 067 Prague, Czech Republic; e-mail: vit.posta@vse.cz; macakova@vse.cz

Then we proceed with the main parts of the text, which are the presentation of the econometrical model of the flows in the Czech labor market and its estimates.

We built the empirical analysis on the search model of the labor market as developed by (Pissarides, 1979 and 1985) and later summarized in his book (Pissarides, 2000). For a brief encounter we also recommend a paper by (Pissarides, 2011). More advanced and general treatment of search models may be consulted in Ljungqvist and Sargent (2004). The model is summarized in Part 3.

While the use of the search/flow model of the labor market is widespread in case of foreign economies, there are very few results for the Czech labor market.

New vacancies are pinned down as a key factor of unemployment fluctuations in the paper by Barnichon (2012). In the examination of the behavior of the labor markets before and after the Great Recession, Sala, Soderstrom and Trigari (2012) show that after the Great Recession the flows in the labor market were more influenced by structural factors in comparison with the good times before the recession. In case of United Kingdom, Gomes (2010) shows that job finding rate follows pro-cyclical behavior while job separation rate develops counter-cyclically. Given the examination of the flows in the labor market, Davis, Faberman and Haltiwanger (2006) show that job creation/destruction amounted to 8% of employment in the US market, which made it much less sclerotic as compared with its European counterparts. Mortensen and Nagypal (2007) with the use of the search model and the US data present estimates of the Beveridge curve. Elsby, Hobinj and Sahin (2008) compare the Anglo-Saxon, Nordic, Central European and US economies and with the use of the flow data show that the Central European economies have by far the most rigid labor markets.

As for the Czech Republic we make use of only two studies. Munich and Svejnar (2009) based on the analysis of the flows in the labor market establish that the two main reasons for a relatively high unemployment rate, especially in the transition period, were restructuring of the economy and lower demand for labor. Pedraza (2008) reveals a significant role of educational structure on the matching process, in other words flows in the labor market.

2. Foreign Workers in the Czech Labor Market

A significant increase in the number of foreigners in the Czech labor market took place already in the 90s, when the Czech Republic became the immigration and transition country (Drbohlav, 2003). After 1994, in the years before the accession to the EU, the number of foreign workers almost doubled, rising to 168 000 at the end of 2003. Nearly 63% were in the position of employees and the remaining 37% foreigners had a business license. The Czech Republic's

accession to the EU in 2004 was associated with a significant increase in the fear of unemployment with respect to the opening of the labor market, a significant change in the unemployment rate, however, did not occur (see Figure 1).

A significant increase in the number of foreigners after 2004 is shown in Figure 2. A comparison of Figures 1 and 2 allows a tentative comparison of the relationship between gradual changes of the number of immigrants and the gradual changes of the unemployment rate in the Czech Republic. Although in the years 2004 – 2008 the number of immigrants was on the rise, the unemployment rate in the same period decreased; a development highly facilitated by the overall economic growth. In the years 2008 – 2009 due to the economic crisis, the unemployment rate rose significantly, while the number of immigrants fell rapidly by more than 50%.

Figure 1

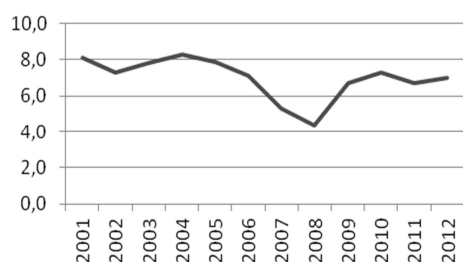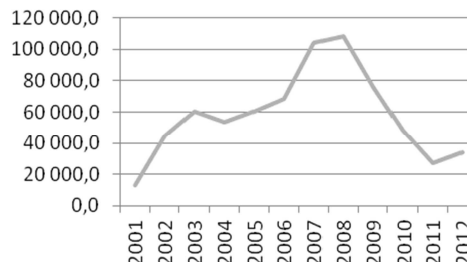**Unemployment Rate in Czech Republic**

Figure 2

**Number of Immigrants in Czech Republic**

Source: Eurostat.

The number of foreigners registered at labor offices in the Czech Republic grew until 2008, when their number reached maximum of 79% of all the foreigners working and in the following years gradually declined. The number of foreigners working through the trade licensing authority after 2008 has slightly increased, especially due to the fact that many foreigners who had lost their jobs, started a business in the Czech Republic. According to the latest figures released in 2011 that there were more than 300 000 foreigners working in the Czech Republic, of which two thirds worked in a salaried employment and one third with a trade licence.

In terms of sector structure of the economy foreigners as employees most often occur in the manufacturing, construction, wholesale and retail trade (see Figure 3). During the years 2008 – 2011 the weight of these sectors gradually changed. While in 2008, the proportion of foreigners in manufacturing was 36%, by the end of 2011 it decreased to 31%. The most significant was the drop in the number of foreigners in construction: from 24% to 14% see Table 1.

F i g u r e 3
Registration at Labor Offices by CZ-NACE Activity Relative to Total in %
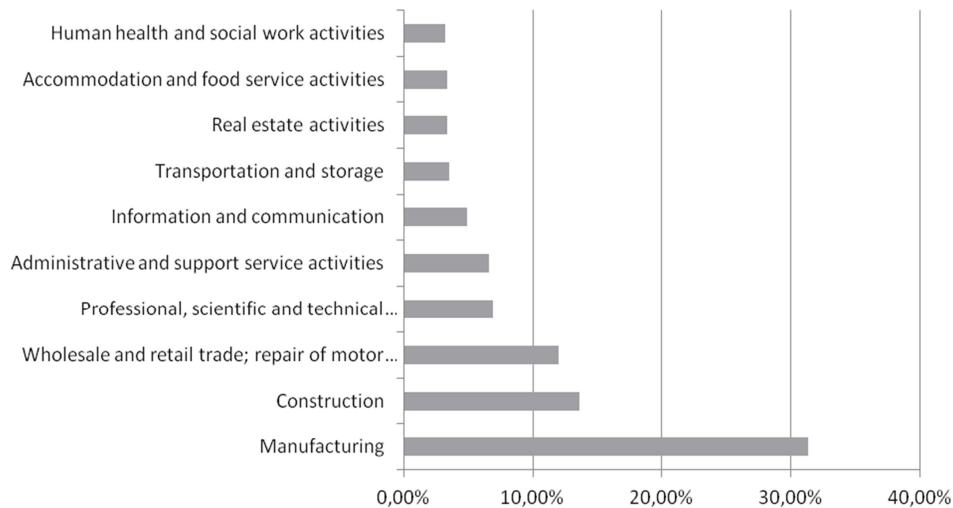
Source: Own elaboration according to the MLSA CR (2011).

T a b l e 1
**Registration at Labor Offices by CZ-NACE Activity**

Type of activity	2008	in %	2011	in %
Manufacturing	102 922	36.2	68 181	31.3
Construction	69 076	24.3	29 580	13.6
Wholesale and retail trade; repair of motor vehicles and motorcycles	23 794	8.4	26 122	12.0
Professional, scientific and technical activities	19 846	7.0	15 018	6.9
Real estate activities	9 119	3.2	7 437	3.4
Administrative and support service activities	8 746	3.1	14 448	6.6
Transportation and storage	7 909	2.8	7 733	3.5
Information and communication	7 267	2.6	10 572	4.9
Accommodation and food service activities	6 169	2.2	7 494	3.4
Human health and social work activities	5 514	1.9	6 930	3.2

Source: Own elaboration according to the MLSA CR (2008; 2011).

Figure 4 gives more accurate information about the structure of qualification of the foreign workers. It shows the distribution of foreigners in the Czech Republic into three groups of CZ-ISCO.

The first three groups of CZ-ISCO represent skilled labor, whose share increased between 2008 and 2011. The shares of semi-skilled labor (CZ-ISCO 4 – 8) and unskilled labor (CZ-ISCO 9) decreased, which was linked with the recession and the subsequent fall in the demand for the output of construction, and in part industry.

F i g u r e 4

Number of Registration at Labor Offices Three Groups of CZ/CZ-ISCO
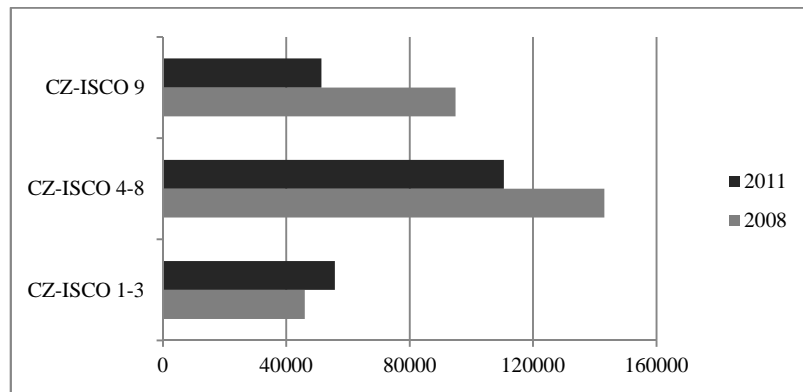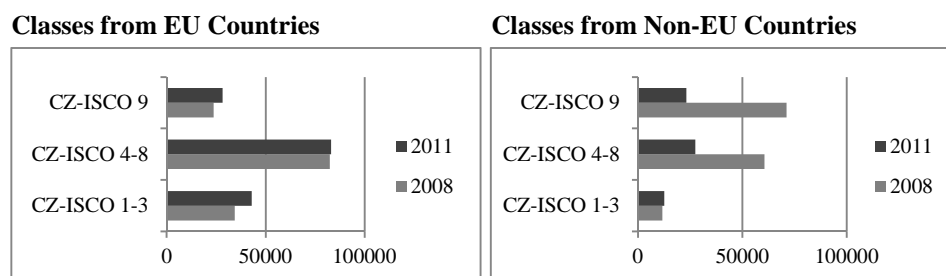

Source: Own elaboration according to the MLSA CR (2008; 2011).

The data of the Czech Statistical Office clearly show that the employment of foreigners as employees falls mainly in three classes CZ-ISCO: „Elementary occupations", „Plant and machine operators, and assemblers", and „Craft and related trades workers". These jobs with low or no educational requirement also correspond to lower average wages.

Figure 5 shows a comparison of the representation of foreigners in different classes according to their country of origin. While the employment of citizens of the EU is mostly within those classes CZ-ISCO classifications which include skilled labor and semi-skilled labor, employment of the citizens of countries outside the EU falls mainly into classes which include unskilled labor and semi-skilled labor. It is clear that the socio-economic level of the country of origin is a factor that significantly affects the status of foreigners in the labor market in the Czech Republic.

F i g u r e 5

Representation of Immigrants from CZ-ISCO Classes According to their Country of Origin

Classes from EU Countries   **Classes from Non-EU Countries**

Source: Own elaboration according to the MLSA CR (2008; 2011).

3. Model

We test and use as a means of the empirical analysis three relations which define the equilibrium in the basic version of the labor market search model. The equilibrium unemployment rate is based on the flows in and out of the unemployed part of the labor force. The outflow is based on the job matching function, which is typically assumed to be homogenous of degree one:

$$m*lf = f\left(u*lf,\ v*lf\right) \tag{1}$$

where

    m – rate of matches (newly occupied jobs),
    lf – labor force,
    u – rate of unemployment,
    v – vacancy rate.

Dividing through by $u*lf$ (and with the assumption of homogeneity of degree one in mind), the result is:

$$jfr = f\left(lmt\right) \tag{2}$$

where

    lmt – labor market tightness, a ratio of rate of vacancy and rate of unemployment.

Therefore labor market tightness increases with the decrease of unemployment rate and/or increase of vacancy rate. In such a situation the probability of filling a vacancy (occupying a new job) increases. This is exactly captured by the left-hand side of equation (2), which is called job finding rate (jfr) – a ratio of the rate of matches and unemployment rate. The flow into the pool of the unemployed is governed by the job separation rate (jsr). The equality of the inflow and outflow gives rise to the equilibrium unemployment (ur) rate:

$$ur = \frac{jsr}{jsr\ +\ lmt*jfr} \tag{3}$$

The relationship (3) states that the equilibrium unemployment rate increases with the increase in job separation rate (jsr) and/or decrease in labor market tightness (lmt) or job finding rate (jfr).

The equilibrium in the labor market is associated with the equilibrium of demand and supply. The derivation of the demand for labor is based on intertemporal optimization of firms seeking to maximize profits. The value of a vacant job depends negatively on the hiring costs associated with acquiring new workers, job finding rate, discount rate and the difference between the values of occupied and vacant jobs. In a similar manner the value of an occupied job is derived from the net return which is given by the difference between productivity of labor and

its cost as well as its value which will be carried over into the next period given the occupied job survives. That is also to express that the value depends on the job separation rate. Given this idea, labor demand may be formulated:

$$lp = w + \frac{(r + jsr) * lp * c}{jfr} \tag{4}$$

Equation (4) states that labor productivity (lp) is equal to the wage rate (w) and the costs stemming from the existence of the hiring costs (c). The term consists of real interest rate, which serves the role of the discount factor (r), and rate of hiring costs (c). Hiring costs increase with labor productivity, which is why total hiring costs are given by the multiplication of the rate of hiring costs and labor productivity. If the rate of hiring costs is zero, equation (4) collapses to the traditional equality between labor productivity and wage rate.

Similarly, labor supply is based on the definition of incomes of the employed and unemployed. The expected income of an employed worker depends on the wage rate, job separation rate and reserve wage (captures the case he or she becomes unemployed in the next period) and the next period income, given he or she stays employed. Since the problem is intertemporal, real interest rate is used as a discount factor. The expected income of the unemployed stems from the reservation wage, expected income of the employed in case he or she becomes employed (thus influenced by the labor market tightness rate and job finding rate) and expected income when unemployed in the next period. The basic model assumes equivalent bargaining strengths (β) of the worker and the firm. The resulting relationship is the wage equation or the labor supply:

$$w = (1 - \beta) * rw + \beta * lp * (1 + c * \theta) \tag{5}$$

The wage function shows a positive relationship between wage and reservation wage (rw), which reflects the income when unemployed, and labor market tightness and labor productivity. Equations (3), (4) and (5) describe the equilibrium of the search model. Substituing hiring costs in equation (4) using equation (5):

$$w = \frac{\beta * lmt * jfr * lp + (1 - \beta) * (r + jsr) * rw + \beta * lp * (r + jsr)}{(r + jsr) + \beta * lmt * jfr} \tag{6}$$

Equation (6) desribes the determination of the wage rate (wages) based on the demand and supply as defined above. The relationship constitutes the first part of our empirical analysis. We use it in the form of a regression:

$$w = c + \alpha_1 * rw + \alpha_2 * lp + \alpha_3 * jfr + \alpha_4 * lmt + \alpha_4 * jsr + \varepsilon_t \tag{7}$$

The second relationship in the form of a regression is directly based on equation (3):

$$ur = c + \alpha_1 * jsr + \alpha_2 * lmt + \alpha_3 * jfr + \varepsilon_t \tag{8}$$

From equation (6) it is obvious that a positive relationship between reservation wage and wage (alternatively expressed as rates) is to be expected as the bargaining strength parameter is positive but less than one. The effects of changes in labor market tightness, job finding rate and job separation rate are less clear since they are included in both the numerator and denominator of equation (6). The respective derivations are:

$$\frac{\partial w}{\partial lmt} = \frac{(r + jsr) * \beta * jfr * \left[(1 - \beta) * (lp - rw)\right]}{\left[(r + jsr) + \beta * lmt * jfr\right]^2}$$

$$\frac{\partial w}{\partial jfr} = \frac{(r + jsr) * \beta * lmt * \left[(1 - \beta) * (lp - rw)\right]}{\left[(r + jsr) + \beta * lmt * jfr\right]^2}$$

$$\frac{\partial w}{\partial jsr} = \frac{(1 - \beta) * \beta * lmt * jfr * (rw - lp)}{\left[(r + jsr) + \beta * lmt * jfr\right]^2}$$

The derivations reveal that the signs of the effects depend on the relationship between labor productivity and reservation wage. It can be deduced that a higher growth of labor productivity with respect to that of reservation wage translates into a positive relationship between labor market tightness and job finding rate. On the other hand it manifests itself as a negative relationship between job separation rate and wage rate. Altogether, the coefficients α_1, α_2, α_3, α_4 in regression (7) are expected to be positive while the coefficient α_5 negative. As far as the coefficients in regression (8) are concerned, it is directly visible from equation (3) that α_1 is expected to be negative while α_2 and α_3 positive. The error terms in regressions (7) and (8) are expected to meet standard criteria: no autocorrelation, normality and no heteroskedasticity. Inclusion of constants in regression (7) and (8) ensures the mean value of the errors will be zero. To test possible effects of foreign workers we augment both the regressions by the share of foreign workers on the labor force.

4. Data

The data used to carry out the analysis were retrieved from the Czech Ministry of Labour and Social Affairs and Eurostat. We used the monthly labor offices' statistics to obtain the data on the unemployed, vacancy, newly employed and

newly unemployed. We used data on labor force from the Labor force survey (LFS), with the use of national accounts' employment and gross value added we computed the labor productivity. We used national accounts' data on wages. National accounts data were obtained though eurostat as well as the data on the minimum wage, which we used as a proxy for the reservation wage. We used eurostat data on foreign workers to express their share in the labor force. The unemployment rate is calculated as a ratio of the unemployed and labor force. Due to the use of the national accounts' data and data on foreign workers we work with quarterly frequency. All the data was seasonally adjusted. With this data at hand job separation rate, job finding rate and labor market tightness are calculated as noted above. All the data are in the form of shares or growths (labor productivity, reservation wage). The statistical properties of the data are summarized in Table 2. The sample is indicated in each case below.

T a b l e 2

Statistical Properties of the Data

Series	Mean	Standard deviation	Normality test	Stationarity test
Reservation wage (rw)	0.006	0.014	85.913 (0.000)	–3.792 (0.000)
Labor productivity (lp)	0.021	0.033	3.199 (0.202)	–2.057 (0.042)
Job finding rate (jfr)	0.076	0.016	2.498 (0.287)	–2.284 (0.039)
Labor market tightness (lmt)	0.159	0.135	19.561 (0.000)	–2.975 (0.000)
Share of foreign workers (sfw)	0.025	0.047	0.580 (0.748)	–6.989 (0.000)
Job searatin rate (jsr)	0.011	0.001	4.103 (0.129)	–2.300 (0.038)
Unemployment rate (ur)	0.088	0.014	7.495 (0.024)	–2.171 (0.040)

Notes: Normality tested by Jarque-Bera test with the null of normal distribution. Jarque-Bera statistic and p-value (in parentheses) given. Stationarity tested by Dickey-Fuller GLS test with the null of unit root. Respective statistic and p-value (in parentheses) given. Sample: 2004q1 – 2014q1 (except the share of foreign workers which ends in 2013q4 and reservation wage which starts in 2004q2).

Source: Czech Ministry of Labour and Social Affairs and Eurostat, our own computations.

To apply the OLS estimation of the regression models it is important to note the fact that the series were found to be stationary at acceptable levels of statistical significance. To give a motivation for the following regression estimates we present the evolutions of most of the variables below.

Figure 6 shows decrease of the job finding rate with the start of the crisis in 2009, but the labor market deteriorated even more in 2011 – 2012 with the „second-round" recession. The onset of the crisis was also marked by an abrupt fall in the labor market tightness (Figure 7) and increase in the job separation rate (Figure 6). Neither of these two variables showed significant deterioration during the second recession. Figures 7 and 8 show a relatively and expected close relationship between the development of labor productivity and wages and again their evolutions are significantly marked with the two recession the Czech economy passed through.

F i g u r e 6

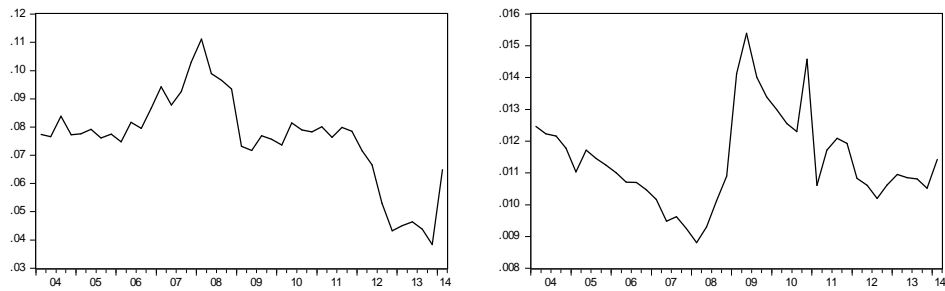**Job Finding Rate** (left) **and Job Separation Rate** (right)

F i g u r e 7

Labor Market Tightness (left) **and Labor Productivity** (right)
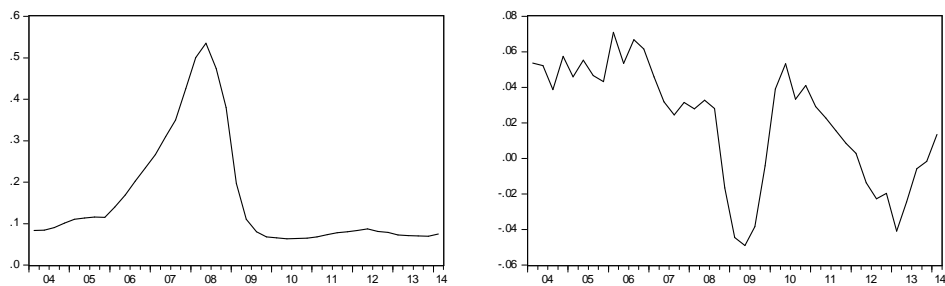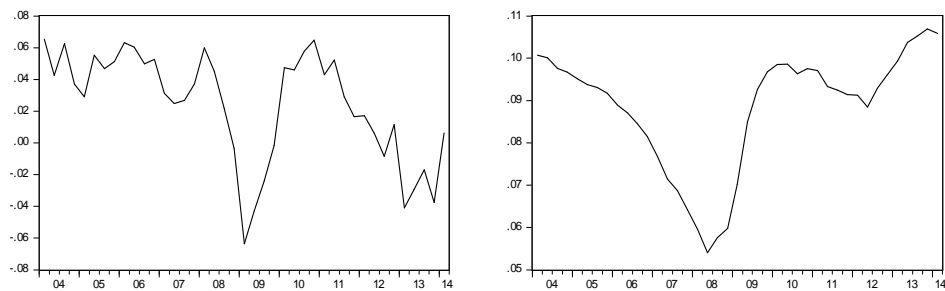

F i g u r e 8

Wages (left) **and Unemployment Rate** (right)

Source: Czech Ministry of Labour and Social Affairs and Eurostat, our own computations.

5. Estimates

Table 3 gives the estimates of regression (7) with and witthout the additional variable of the share of the foreign workers in the labor force. The regression model explains a large portion of the variation of the wage growth as seen from

R-squared coefficients. The labor productivity together with the job finding rate are the most significant factors of wage growth. The effect of job separation rate is also significant in the model without the share of foreign workers. The effect of reservation wage is significant in the model without the share of foreign workers but with the oposite sign. Labor market tightness is highly significant, however, with the oposite sign. The residuals of both the versions are normal, homoskedastic and do not display autocorrelation.

T a b l e 3

Regression for the Wage Growth

Sample	2004q2 – 2014q1	2004q2 – 2013q4
Observations	40	39
Constant	0.003 (0.914)	0.002 (0.941)
rw	–0.296 (0.094)	–0.359 (0.129)
lp	0.768 (0.000)	0.782 (0.000)
jfr	0.872 (0.005)	0.892 (0.008)
lmt	–0.090 (0.017)	–0.093 (0.024)
jsr	–3.936 (0.097)	–4.010 (0.108)
sfw	–	0.021 (0.703)
R-squared	0.859	0.834
LM test (1)	0.442 (0.506)	0.796 (0.372)
LM test (2)	0.622 (0.733)	0.969 (0.616)
LM test (3)	0.719 (0.869)	1.032 (0.794)
Harvey test	3.826 (0.575)	6.845 (0.336)
Normality test	1.010 (0.604)	1.007 (0.604)

Notes: Normality tested by Jarque-Bera test with the null of normal distribution. Jarque-Bera statistic and p-value (in parentheses) given. Heteroskedasticity tested by Harvey test with the null of homoskedasticity. Harvey statistic and p-value (in parentheses) given. Autocorrelation tested by LM test. LM statistic and p-value (in parentheses) for the first three lags given. Significance of estimated coefficients tested by t-tests with the null of them being zero. T-statistics and p-value (in parentheses) given.

Source: Czech Ministry of Labour and Social Affairs and Eurostat, our own computations.

We suppose the estimated opposite sign in case of the reservation wage may be due to the proxy used. We proxied the variable with the measure of minimum wage only and descarded the role of other social receipts. Clearly no official measure of reservation wage is published and the inclusion of social contributions raises the questions as to which data should be used and also normally leads one to use data with lower frequency, which would preclude any analysis in this case.

What is in our opinion more puzzling is the estimated opposite sign of labor market tightness, especially given the high statistical significance of the estimate. One possible explanation leads us to consider the sectoral structure of the economy with the dominating effect of manufacturing. It might be the case that when the economy went through the period of significant growth and increasing labor market tightness (Figure 8), the spillover into the wage growth in manu-facturing might have been rather limited due to the lower levels of required skills and experience in this sector. Second point is rather technical: except for the

period of the boom and drop, the series is significantly less volatile than the others, which may also influence the results. Unfortunately, we cannot run the regression on subsamples given the relative shortness of the main sample and we do not have relevant data to make similar estimates for the sectors of the economy, which might help to answer the first question.

As far as the role of foreign workers is concerned, the fact that the estimates of the other coefficients remained similar, the explanatory power of the model is also similar and the estimated coefficient of the share of foreign workers is insignificant, the model does not show any support for its influence on the development of wages. However, here we would like to stress the fact that this view might be modified on the level of the sectors of the economy. Nonetheless this particular analysis cannot be performed on the level of sectors due to the lack of data or the inexistence of their counterparts on the level of sectors (e.g. unemployment). Table 4 presents the output of the estimate of regression (8).

T a b l e 4

Regression for the Unemployment Rate

Sample Observations	2004q2 – 2014q1 40	2004q2 – 2013q4 39
Constant	0.021 (0.010)	0.022 (0.009)
jsr	1.597 (0.000)	1.613 (0.000)
jfr	–0.175 (0.000)	–0.184 (0.000)
lmt	–0.009 (0.102)	–0.009 (0.152)
ur(–1)	0.726 (0.000)	0.716 (0.000)
sfw	–	–0.007 (0.275)
R-squared	0.889	0.887
LM test (1)	4.154 (0.052)	3.021 (0.082)
LM test (2)	4.378 (0.112)	3.036 (0.219)
LM test (3)	6.039 (0.110)	3.975 (0.264)
Harvey test	3.252 (0.517)	4.356 (0.499)
Normality test	0.395 (0.821)	0.406 (0.816)

Notes: Normality tested by Jarque-Bera test with the null of normal distribution. Jarque-Bera statistic and p-value (in parentheses) given. Heteroskedasticity tested by Harvey test with the null of homoskedasticity. Harvey statistic and p-value (in parentheses) given. Autocorrelation tested by LM test. LM statistic and p-value (in parentheses) for the first three lags given. Significance of estimated coefficients tested by t-tests with the null of them being zero. T-statistics and p-value (in parentheses) given.

Source: Czech Ministry of Labour and Social Affairs and Eurostat, our own computations.

To make the residuals reasonable and also to keep the method of the estimate the same, we had to make use of lagged value of unemployment and put it in the regression as an explanatory variable. On one hand it makes sense because typically equilibrium unemployment is believed to follow a rather persistente autoregressive process. On the other hand the explained variability of the unemployment rate should not be compared with the previous model because the R-squared is significantly boosted by the inclusion of the autoregression of the unemployment

rate. Job separation and job finding rates proved to be highly significant in the determination of the unemployment rate. The estimated sign of the coefficient of labor market tightness is correct, however its significance is weaker. Not even in the case of the unemployment rate does the model show support for the role of foreign workers. The residuals of both the versions are normal, homoskedastic and do not display autocorrelation. We summarize the findings in the conclusion.

Conclusion

Development of the number of foreign workers in the Czech Republic, documented by the available statistical data, sensitively responded to the slowdown of the Czech economy in the context of the development of the economic crisis. While rapidly growing Czech economy after accession to the EU increased due to lack of domestic labor demand for foreign workers, due to the economic crisis, this trend stopped in 2008 and the number of foreign workers fell significantly. There was only the growth of the number of foreigners holding trade license, which was partly due to the fact that foreigners who have lost their jobs in this way tried to avoid having to leave the Czech Republic. A comparison of the relationship between gradual changes of the number of immigrants and the gradual changes of the unemployment rate in the Czech Republic showed that though in the years 2004 – 2008 the number of immigrants increased, the unemployment rate in the same period decreased and in next two years due to the economic crisis, the unemployment rate rose, while the number of immigrants fell. Testing the possible impact of foreign workers on the dynamics of unemployment and wages in the environment search model and using regression analysis did not confirm the influence of foreign workers on these two variables, but confirmed the relatively strong effects of labor productivity, job finding rate and labor market tightness on the development of wages and of job separation rate and job finding rate in case of unemployment rate.

References

BARNICHON, R. – FIGURA, A. (2013): Labor Market Heterogeneity and the Aggregate Matching Function. [Working Paper 727.] Barcelona: Barcelona Graduate School of Economics. Available at: <http://research.barcelonagse.eu/tmp/working_papers/727.pdf>.

BARNICHON, R. (2012): Vacancy Posting, Job Separation and Unemployment Fluctuations. Journal of Economic Dynamics and Control, *36*, No. 3, pp. 315 – 330.

BARNICHON, R. – FIGURA, A. (2010): What Drives Movements in the Unemployment Rate? A Decomposition of the Beveridge Curve. [Finance and Economics Discussion Series 2010-48.] Washington, DC: Divisions of Research & Statistics and Monetary Affairs Federal Reserve Board. Available at: <http://www.federalreserve.gov/pubs/feds/2010/201048/201048pap.pdf>.

CSO (2015): Foreigners in the Czech Republic, Employment, Data Sources Online. Available at: <http://www.czso.cz/csu/cizinci.nsf/kapitola/ciz_zamestnanost>.

DAVIS, S. J. – HALTIWANGER, J. (2014): Labor Market Fluidity and Economic Performance. [Working Paper, No. 20479.] Cambridge: NBER.

DAVIS, S. J. – FABERMAN, R. J. – HALTIWANGER, J. (2006): The Flow Approach to Labor Markets: New Data Sources and Micro-Macro Links. Journal of Economic Perspectives, *20*, No. 3, pp. 3 – 26.

DRBOHLAV, D. (2003): Immigration and the Czech Republic (with a Special Focus on the Foreign Labor Force). International Migration Review, *37*, No. 1, pp. 194 – 224.

ELSBY, M. – HOBINJ, B. – SAHIN, A. (2008): Unemployment Dynamics in the OECD. [Working Paper, No. 14617.] Cambridge: NBER.

GOMES, P. (2010): Labour Market Flows: Facts from the United Kingdom. [IZA DP, No. 5327.] Madrid: Universidad Carlos III de Madrid.

LJUNGQVIST, L. – SARGENT, T. J. (2004): Recursive Macroeconomic Theory. Cambridge: MIT Press.

MLSA (2008; 2011): Integrated Portal MLSA, Statistics and Data Sources. [Online.] Available at: <http://portal.mpsv.cz/sz/stat>.

MORTENSEN, D. – NAGYPAL, E. (2007): More on Unemployment and Vacancy Fluctuations. Review of Economic Dynamics, *10,* No. 3, pp. 327 – 347.

MUNICH, D. – SVEJNAR, J. (2009): Unemployment and Worker-Firm Matching: Theory and Evidence from East and West Europe. Washington, DC: World Bank: Available at: <https://openknowledge.worldbank.org/handle/10986/4008>.

PEDRAZA, P. (2008): Labour Market Matching Efficiency in the Czech Republic Transition. [Working Paper, No. 920.] Ann Arbor: William Davidson Institute

PISSARIDES, C. A. (2011): Equilibrium in the Labor Market with Search Frictions. American Economic Review, *101*, No. 4, pp. 1092 – 1105.

PISSARIDES, C. A. (2000): Equilibrium Unemployment Theory. Cambridge: MIT Press.

PISSARIDES, C. A. (1979): Job Matchings with State Employment Agencies and Random Search. Economic Journal, *89*, No. 356, pp. 818 – 833.

PISSARIDES, C. A. (1985): Short-Run Equilibrium Dynamics of Unemployment, Vacancies, and Real Wages. American Economic Review, *75*, No. 4, pp. 676 – 690.

SALA, L. – SODERSTROM, U. – TRIGARI, A. (2012): Structural and Cyclical Forces in the Labor Market during the Great Recession: Cross-Country Evidence. [Working Paper, No. 18434.] Cambridge: NBER.